Python Human Heat Balance (PyHHB) to assess survivability and liveability using climate model data with a time resolution of 3 and 6 hour.

This repository contains the source code for generating the survivability (Figures 2, S2, S3) and liveability (Figure 4, S6, S7) matrices as developed in Vanos et al. (2023), A physiological approach for assessing human survivability and liveability to heat in a changing climate.

In this paper the framework for heat survivability modeling is improved and is introduced an approach to assess liveability due to extreme heat exposure that can be applied in any climate regime and customized with population groups with potential co-morbidities. This new approach integrates well-established and fundamental principles from thermal physiology and human biophysics and accommodates 3- and 6-h exposure windows aligning with outputs from climate models and past survivability studies.

Read **Considerations of New Model Estimating Physiological Survivability Limits and Liveability in the Supplemental material for understanding the differences of this approach regarding**

**Tw 35 is hubber.**

**How is defined the limit of survivability (Survivability: Boolean):**

The limit of **survivability to heat stroke death** as reaching a Tcore of 43°C in 3- or 6-hour exposure windows to allow for comparison with the Tw of 35°C assumption (heat stroke death after 6 hours).

**How is defined liveability (Mmax: float):**

Mmax is the maximum internal heat production, or level of physical activity, that a person can generate without a sustained positive rate of heat storage in the prevailing environment, thus allowing safe, sustained work and play for an extended period.